

## NITRATES AND OTHER ANIONS INVOLUCRATED IN ARSENIC MOBILITY PROCESS

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### T2. Contaminación difusa y puntual

In Spain, arsenic was detected in groundwater in the Tertiary Duero River Basin of the North Iberian Meseta (García-Sánchez and Álvarez-Ayuso, 2003; Sahún, 2004). In this area, arsenic mobilisation could be attributed to its displacement from aquifer sediments by microbiological and chemical processes (García-Sánchez et al., 2005).

Chemical characteristics of groundwater from two Provinces of central Spain (Valladolid and Segovia) were studied. In some zones of this area the concentrations of As in groundwater exceed WHO recommendation 10 µg/l. Significant positive correlations among arsenic and bicarbonates and arsenic and pH were observed. These data suggest a possible mechanism of As mobilization from sediments to groundwater: bicarbonate ions could displace  $\text{HAsO}_4^{2-}$  adsorbed on aquifer Fe oxyhydroxides. The high groundwater pH, might favoured the As desorption processes too.

The objective of this study is show temporary variation of As content in groundwater of south Duero River Basin, along three years and its relation to agricultural soils  $\text{NO}_3^-$  pollution. Modifications of surface complexation of As by HFO and redox processes that affect Fe speciation can also have a strong effect on As mobility (Cummins et al., 1999).

Negative significant correlation between arsenic and nitrates contents in water might explain the temporary evolution of arsenic concentration along the three successive years considered in this study. The widespread agricultural use of nitrogen fertilizers and pig manure, generate increase of nitrate content in water. Nitrate is a strong oxidiser, and could have favoured the precipitation of Fe oxyhydroxides and inhibition of Fe (III) reduction, and its solubilisation. These processes could promote Arsenic sorption on sediments and inhibit its mobilisation into the water. On the other hand, the recent cancellation of the wells that supplied drinking water to affected towns of this area might to help to decrease of arsenic content, due a diminution of the water flow.

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